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ABSTRACT

The aim of Royal Australian Air Force (RAAF) training is to provide RAAF personnel with the skills, attitudes, and knowledge necessary for them to do their jobs effectively. This paper discusses the issues involved in implementing a training system using the Royal Australian Air Force Distance Learning System (RAAFDLS) as a case study. To determine what sort of an infrastructure the RAAFDLS needed to accommodate all of the training needs in distance learning, and to what extent distance learning would be used, training providers were surveyed on what courses have the potential to convert to a distance learning methodology and what methods and media could best be used to deliver the course. A number of courses were identified as having potential for conversion, and many educational technologies were recommended for use in the new system. To generate the potential for savings in implementing the system, the costs of the equipment and savings in training time were calculated and compared. It was determined that the proposal for the RAAFDLS would provide the following services: data conferencing (computer mediated communication); delivery of computer based learning; voice conferencing; and computer-managed learning. These services would enable students to: communicate with teachers and fellow students; gain access to teaching materials such as lecture notes and assignments; and have access to many of the information sources accessible to students who attend formal classroom teaching. Equipment needs for these services are listed, and details are provided concerning the Distance Learning Agency and Base Training Centers established to manage and administer the RAAFDLS and its resources. (Contains 13 references.) (AEF)

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# Getting the Job Done: Distance Learning in the RAAF

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*In recent years the philosophy of Open Learning has emerged as a possible future for education and training in Australia. Open Learning can be considered as an umbrella term which refers to a whole series of varied educational initiatives and approaches (Kember, 1995), the most commonly known approach is that of Distance Education. It provides greater flexibility and access to training and education than traditional classroom based approaches. Organisations adopting the philosophy can refer to many successful working examples as a guide on which to model themselves. However, with all this growth in Open Learning there still exists a need for specialist training systems to meet specialist training requirements.*

The Royal Australian Air Force (RAAF) is a unique organisation that conducts the majority of its own training for its personnel located right across Australia and the rest of the world. It performs a role that no other organisation in Australia performs, its mission being to prepare for, conduct and sustain effective air operations to promote Australia's security, and therefore has a unique training requirement and a clearly defined need for a specialised training system. The 1990's have provided many changes for the RAAF and strategies are needed to face these changes with confidence.

In the early 1990's there was a shift towards using distance learning approaches with the formation of Base Training Centres (BTCs) and the establishment of local facilitators for technical trade restructure training. These initiatives were to employ technology to supplant some face-to-face instruction with computer-based instruction, but a capability to retain human-human interaction through electronically linking directing staff with remote students was not evolved (Wallace, 1993). Modern computer and communications technologies offer the capability of providing human-human interaction between dispersed geographic locations but at a large cost.

Studies undertaken within the RAAF showed that conferencing strategies have wide application within the RAAF as long as a centralised system was established. This system could be centrally coordinated and shared by all providers of training and therefore would offer turn-key access to defined conferencing functions and achieve efficiencies by the spreading of costs over many users (Wallace, 1993).

The studies led to a proposal for the establishment of a system, the RAAF Distance Learning System (RAAFDLS). This system will be an electronic infrastructure that will support the electronic delivery and management of training to all RAAF establishments and thereby realise reductions in the cost of effective training (RAAF, 1995).

This paper will discuss the issues involved in implementing a unique training system, using the RAAFDLS as a case study. Before discussing these issues a brief overview will be given of the RAAF Training System, the RAAF concept of distance learning and where it is intended to be used.

## The RAAF Training System

The aim of RAAF training is to provide RAAF personnel with the skills, attitudes and knowledge necessary for them to do their jobs effectively (RAAF, 1991). The RAAF philosophy of training encompasses the following four components:

a. the systems approach to training,
b. continual improvement,

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c. quality recruitment and selection, and
d. individual responsibility. (RAAF, 1991)

The RAAF system is managed to ensure effective and efficient use of resources. Management of the system includes:

a. training manpower management — the conduct of basic and post-graduate training, manpower categories (the training force and the trained force), course manning and manpower cost of training.
b. strategies and authorisations — mustering training strategies, graduation requirements, syllabuses, instructional strategies and testing strategies for each mustering/ trade group;
c. scheduling and tasking — planning, centralised training schedules and unit-scheduled training.
d. resource management, and
e. evaluation and control. (RAAF, 1991)

The fundamental elements of the RAAF training system mentioned above apply to all instructional strategies used and therefore do not change when considering the implementation of a distance learning system.

## Profiling the Needs

An individual's training in the RAAF commences from the point of recruitment where each individual undergoes basic induction training lasting for approximately 12 weeks. Basic training for officers is conducted in Melbourne and airmen basic training in Adelaide. On graduation from basic training graduates are sent to the relevant Defence training establishment to receive their job specific training, eg pilot, clerk, technician. Job specific training is that training that a person requires to qualify in a trade or profession. This training can take up to a year to complete at the schools located at different Defence establishments throughout Australia. These schools also conduct other post-graduate training in a range of non-job specific skills, which are required in many different professions or trades during the course of a persons RAAF career.

With the types of training outlined above it is obvious that RAAF personnel spend a considerable amount of time travelling to where the training is being conducted. This travel takes people away from their workplace for a considerable amount of time and also costs a lot of money as travel and accommodation must be provided. Also, schools can only program a certain number of courses per year and therefore it cannot be guaranteed that RAAF personnel will receive the necessary training by the time they need to apply the skills. Such cases illustrate the potential for productivity problems. In some cases personnel receive training so late that they have already learnt how to do the job on the job before they attend the course. However, there is no guarantee that they will have correct job skills without appropriate training.

A system that allows RAAF personnel to gain access to training at their workplace when it is needed and at the right time, for both them and their immediate employer, should be able to overcome some of the identified problems with the current system.

## What is Distance Learning?

The basic idea behind distance learning is the separation of teacher and learner which distinguishes it from traditional face-to-face lecturing (Keegan, 1980). Distance Learning is identified in the RAAF as a strategy for organising learning and teaching, as well as an attempt to improve access to learning (Wallace, 1994). Training at a distance is not a new concept for the RAAF, they have been conducting individual courses using the paper-based correspondence method for many years. In recent times major structural changes with the Airforce have identified a need to redefine the RAAF's distance learning strategy and expand the use of distance learning to provide just-in-time training that is cheaper and less manpower intensive to deliver.

Adopting a new distance learning methodology that utilises emerging technologies, for selected courses, has the potential to provide the following benefits identified as essential to RAAF distance learning:

a. manpower efficiencies as a lower instructor/student ratio is required for distance learning.

b. just-in-time training as personnel can obtain training at the time the training is needed for successful performance in the job.
c. cost-savings as less travel and accommodation expenses are incurred.
d. flexibility as personnel receive training at their and most importantly their unit's and section's convenience.
e. time savings as no time is wasted travelling to and from the training.
f. productivity gains as personnel become effective in the job sooner.

In 1992, a restructure was carried out of all the technical trades in the RAAF and as a consequence formal training was reduced from a maximum 18 months where an airmen would graduate as a technician to a maximum 20 weeks where they would graduate as a mechanic and gain their technician status over 2 to 3 years through distance learning. The distance learning is carried out on the job and at Technical Distance Learning Flights (TDLFs), especially established at each RAAF base for this training. The TDLFs are equipped with computers and technical equipment and have instructors that facilitate and support the students in their self-paced distance learning courses. This implementation saw the emergence of 'just in time' training and saw airmen become productive in the workforce a lot sooner than previously.

The restructure of the technical trades was followed by a restructure of the non-technical trades and an adoption of a distance learning methodology for some training. Unfortunately, resources that were provided for the technical trades, such as TDLFs, were not available for the non-technical trades. Headquarters Training Command (HQTC) therefore saw the need for a RAAF-wide distance learning system and established an agency whose task was to develop a proposal for a RAAF-wide distance learning system, RAAFDLS. This system would make use of technical media: print, audio, video or computer; to unite teacher and learner and carry the content of courses (Kember, 1995).

## RAAF Distance Learning System (RAAFDLS)

In order to determine what sort of an infrastructure the RAAFDLS needed to accommodate all of the training needs in distance learning, and to what extent distance learning would be used, it was necessary to survey the training providers and ask them what they needed and what they would use if it was available. Even though most were inexperienced in the area of distance education, every training provider was surveyed and asked basically two questions:

a. what courses have the potential to convert to a distance learning methodology? and
b. what methods and media could best be used to deliver the course?

The use of technology was seen as essential to the infrastructure of the new system. Ceri (1986) stated that new (information) technologies themselves provide the best means for coping with training needs. The list of potential technologies that could be used was endless and the following is a list of educational technologies currently used in Australia for Open Learning that were considered:

a. Computer Mediated Communication (eg. Deakin and Charles Sturt University, Victorian Directorate of School Education)
   - email
   - bulletin board systems
   - computer conferencing
b. Audio (eg. WA Distance Education Consortium, Queensland Open Learning Centres)
   - audio-conferencing
   - radio
c. Computer Based Learning (eg. OTEN, SA DETAFE, University of Wollongong)
   - computer base training (CBT)
   - interactive multimedia
   - hypermedia
   - computer-managed learning (CML)
d. Video conferencing (eg. Telecom, UNE, NT Batchelor College)
e. Storage media — optical disk (eg. NRMA, NSW TAFE Library services)
   - CD-ROM
   - CD-I
   - interactive videodisc (OTEN, 1994)

In surveying the different RAAF training providers it was necessary to provide them with a list of what educational technology would be available in order to give an idea of what was possible. In developing the list it was necessary to determine the potential disadvantages of distance learning, such as lack of interaction, and identify technology to overcome these (Black & Cowan, 1988). The list consisted of equipment for data conferencing (CMC), voice conferencing, video conferencing and computer-based learning (CBL), but ultimately the technology that would form part of the system would have to be justified in terms of potential usage and cost.

## The Criteria of Efficiency

There was a very positive response to the survey and a number of courses were identified by the training providers as having potential for conversion. The savings in converting the recommended courses, just in terms of travel, were calculated to determine the potential savings across all courses.

A figure was then calculated on what it would cost to provide the technology that would be needed for the system. An essential feature of the system was cost-effectiveness, as research has shown that media and communication technologies which have proved to be efficient, at least for some educational purposes, have often not been able to justify their place because of relative costs (Blom, Krane & Rekkedal, 1988). In order for the system to receive funding approval, the cost of the equipment needed to be recouped in savings in training in the shortest possible time.

The two figures were compared to generate the potential for cost-savings in implementing the system. It was thus determined that video conferencing could not be justified in terms of cost and initial benefits. Once the RAAFDLS was fully operational the need for video conferencing could be re-assessed and funding requested if there was more demand and costs were lower. Without video conferencing the cost of the equipment could be recovered in savings in training in two years.

The proposal for the RAAFDLS would provide the following services:

a. data conferencing (CMC),
b. delivery of computer based learning (CBL),
c. voice conferencing, and
d. computer-managed learning (CML).

The above services would enable students to:

a. communicate with their teachers and fellow students via their computers and voice conferencing equipment,
b. gain access to teaching materials such as lecture notes and assignments via their computer, and
c. have access to many of the information sources easily accessible to students who attend formal classroom teaching. (Black & Cowan, 1988).

In order to provide the services mentioned above the following equipment would be purchased:

a. 48 Multi-media PCs
b. 160 Classroom PCs
c. 19 voice point speakers
d. 52 modems
e. Air Force Training Information System (AFTIS) software.

The above equipment would see a minimum of 2 Multimedia PCs, 8 Classroom PCs and 2 modems per RAAF base. The equipment would provide the following:

a. Multimedia PCs — will provide a standard configuration for which materials featuring graphics, text, sound and video may be developed. These PCs are fitted with CD-ROM drives.
b. Classroom PCs — will provide a standard device configuration for which courseware featuring graphics, text, sound and video may be delivered, and may be used for instructor-led activities such as Office Automation training.
c. Voice point speakers- will provide voice conferencing through defence telephone lines.
d. Modems — will enable access to the RAAF Training Bulletin Board Service that currently provides electronic data transfer, messaging and bulletin broadcast within defined forums as an interim support measure until the AFTIS is fully operational.

e. AFTIS software- will provide a distributed database and data communication system with functions to support the remote delivery and management of training. (RAAF, 1995)

The RAAF is currently in the process of establishing a wide area network (RAAFNET) that will see the majority of PCs, including those of the RAAFDLS, connected by the end of 1996. This would allow PCs to speak to each other no matter where they were located in the country. The AFTIS software would make use of the RAAFNET by being housed on a PC that connects into it. This PC would be the server for the RAAFDLS and would be located at Headquarters Training Command (HQTC) RAAF Distance Learning Agency (RAAFDLA), at Point Cook in Victoria.

The RAAFDLA was specifically established to manage and administer the RAAFDLS and its resources. The agency's responsibility is to completely focus their efforts on providing the system so that training providers can concentrate solely on developing training for this with little worry about the technology. The presence of the agency also provides a way in which to standardise the distance learning which is being distributed throughout the RAAF.

As well as the RAAFDLA, Base Training Centres (BTCs) that will administer the distributed local RAAFDLS resources were established at each base. The staff at these centres would employ standardised procedures to assist local students to access the RAAFDLS. The centres can be seen as the support service that is normally provided by other institutions when delivering distance or open learning courses.

Training providers would liaise directly with the RAAFDLA at HQTC to distribute any computer-aided instruction or register any courses or students on the system, and liaise directly with BTCs for use of computers or voice conferencing equipment.

## Management of RAAFDLS

The RAAFDLA has been established for two personnel, a System manager and the AFTIS database controller. It is the responsibility of the RAAFDLA to implement as well as manage the running system. This includes formulating and promulgating the following:

a. a configuration management plan,
b. policy and procedures,
c. guidelines for developing training courses that will be delivered by the system, and
d. proposals for future equipment purchases.

The configuration management plan is a plan to manage the configuration of the RAAFDLS resources during their life. The RAAFDLA will ensure that any training developed to run on RAAFDLS resources will run and therefore it is essential to ensure that the configuration of all resources remains the same. Any changes that are made to the configuration by the RAAFDLA will be done to all computers at the same time.

The formulation of the policy and procedures will prove to be a difficult task because the system is so unique. The RAAFDLS policy and procedures need to detail:

a. a description of the system and a statement of the principles,
b. statements of objectives and action to achieve those objectives, and
c. specifications on what is to be done and how to do it. (Holdaway, 1992)

With such a large proportion of resources distributed throughout the country it is imperative that policy and procedures are detailed enough to ensure the resources are being put to proper use and the system operates at its optimum level. As the system grows procedures will change and in some cases it will be from lessons learnt. The main responsibility of the RAAFDLA here is to monitor the progress of the system and seek constant feedback from training providers, students and other users.

Producing guidelines for the development of training for the system is a very important aspect from the training providers point of view because experience using the available technology is in short supply within the RAAF. An important goal of the system is for it to broaden with time and provide development opportunities for those using it (Blom, Krane & Rekkedal, 1988). The key to quality training is still good trainers (Pelton, 1988) and therefore it is essential to consider the needs of the trainers developing courses for delivery by the system. In a lot of cases the training will evolve and become more effective as lessons will be learnt. The role of the RAAFDLA in this process is to ensure that lessons learnt early on are disseminated so that the development process becomes as painless as possible.

In discussing all the RAAFDLS issues there has been no discussion of the impact of this new system on the students. Personnel within the RAAF are no strangers to change but a lot of them have matured with a traditional training and education system. Just as a large proportion are struggling to come to terms with technology in the workplace, it can be expected that a similar amount will have problems with the RAAFDLS. Support services will have to be made available to students by training providers to ensure the success of training at a distance. The RAAFDLA will discuss issues like these with providers before any training takes place on the system.

When the current system is fully operational a review will be conducted to evaluate the effectiveness of the system and identify areas where change is required and improvements can be made. New technologies are emerging everyday and their relevance to the system will need to be explored. Training providers will be encouraged to provide feedback and suggestions of services that they would like the system to provide.

## Summary

The RAAFDLS was developed as a specialised training system to meet the unique and special requirements of the Royal Australian Air Force. The lessons learnt by the RAAF in establishing this system are already being used by the Royal Australian Navy in the development of a Flexible Delivery System and will no doubt come in use to the Army in the near future.

Ultimately, the success of the RAAFDLS depends on its use and the RAAFDLA will continue to work hard to provide a system that meets the needs of both training provider and student (Dolan, 1995). The key to success of the Agency will be its continued reflection on the processes it is employing to provide the system, and continued research into potential improvements of the system.

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